Research outline: Covid-19, ICP and the online price and product data

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Introduction

Since the outbreak of Covid-19, statisticians have struggled to gain an accurate perspective on price developments. The lockdown measures that many governments instituted complicate price measurement in two ways:

A. The collection of price data was disrupted, either because activities were shut down or because price collectors were not sent to stores.

B. Expenditure patterns shifted rapidly and substantially, rendering fixed consumption baskets much less reliable.

These challenges have mostly been discussed in the context of consumer inflation measurement, including in Diewert and Fox (2020) and Cavallo (2020). Yet in the context of PPP measurement, these challenges will no doubt be important, too, and potentially in different ways than for inflation measurement. For instance, how to interpret the PPP between country A and B when either or both countries are under lockdown conditions? Will PPPs show greater variability under lockdown conditions, making annual figures less representative? These are very much exploratory questions that are nonetheless pressing given the goal of producing useful PPP statistics for ICP 2021.

Proposal

We propose the following research agenda to address some of these questions:

1. In Cavallo et al. (2018), we demonstrated that online price data could be used to produce near real-time PPP estimates for 26 basic headings in food (COICOP 01), fuel (7221) and electronics (911). These data were developed for the Billion Prices Project (BPP) by PriceStats LLC and covered 11 countries at a quarterly frequency.[1] Expanded data collection means that we can currently analyse data for at a monthly frequency. The main benefit of this data source is that it is not affected by the challenges that traditional price collection faces under lockdown conditions. An additional benefit is that we observe prices at a monthly frequency, so that we can more clearly identify periods during whichlockdown restrictions were imposed.

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[1] Argentina, Australia, Brazil, China, France, Germany, Japan, South Africa, Spain, UK and USA.

These data allow us to assess whether, in a very descriptive sense, we can expect to see different patterns in BH PPP data in the Covid-19 period compared to the period before. More specifically, we will:

   a. Compute monthly BPP PPPs for the 26 basic headings (BH) and 11 countries for the period from 2017Q1 to 2021Q2, using monthly country-product dummy (CPD) regressions for each basic heading.

   b. Compare BPP BH PPPs for 2017 to ICP 2017 BH PPPs and compare BPP BH PPPs for 2017–2020 to Eurostat BH PPPs for this same period, to assess the comparability of BPP data to official PPP statistics (as also done in Cavallo et al. (2018)).

   c. Compare to what extent bilateral BPP BH PPPs show different patterns, changes over time and/or variability when one or both countries start imposing lockdowns (using information on lockdown stringency).

One methodological question under a. is whether there may be useful alternatives to CPD regressions. A methodological question under b. is how to aggregate the monthly BH PPPs to annual PPPs for comparison ICP and Eurostat PPPs. One option would be to consider each monthly observation as a separate price quotation in an annual CPD regression. This in turn might be equivalent to a geometric mean of monthly BH PPPs, but this question warrants closer consideration.

2. Diewert and Fox (2020) have shed important light on the question how CPI data are affected by Covid-19, not just in a practical sense but primarily in how lockdown conditions drive a larger wedge between conceptually useful measures of the cost of living and what we actually (can) measure. In a similar sense, we can imagine that PPP statistics face similar challenges, but a more organised discussion of this is missing so far.

3. The empirical analysis under point 1 engages with measurement complication A, i.e., that observing prices is more difficult. But measurement complication B—large and rapid shifts in expenditure patterns—is at least as pressing for the compilation and interpretation of inflation measures. In the absence of high-frequency consumer expenditure surveys, it may be feasible to use information on how broadly available products are to infer expenditure shares, as demonstrated by Antoniades, Feenstra and Xu (2019). We will explore to what extent this approach can be useful in the context of PPP measurement under Covid-19.

Proposal 1 is concrete and actionable, and we expect to be able to provide a presentation at the November 9–11 TAG meeting. Proposals 2 and 3 need further development and we propose to discuss how and when these will be further developed following that same TAG meeting, also considering reactions and feedback on the presentation of proposal 1.